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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

KIM, YOUNG J

ART UNIT PAPER NUMBER

1637

DATE MAILED: 01/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/816,763

Applicant(s)

REMACLE ET AL.

Examiner

Young J. Kim

Art Unit

1637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-8,12-22,34,36 and 37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-8,12-18,22,34,36 and 37 is/are rejected.
- 7) ☒ Claim(s) 1,2,4-8,12-22,34,36 and 37 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Preliminary Remark

The Examiner of record has been changed. All further correspondence regarding this application should be directed to Examiner Young J. Kim whose Group Art Unit is 1637.

With regard to Applicants' statement regarding the propriety of the Final Rejection mailed on June 29, 2004 (page 7, Response), the present Examiner cannot comment as the previous Examiner is no longer with the current Art Unit. However, the argument is considered moot in view of the filing of the instant RCE.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 12, 2004 has been entered.

Election/Restrictions

The cancellation of claims 23-33, drawn to non-elected invention without traverse is acknowledged.

Priority

Applicant cannot rely upon said foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Claim Objections

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Claim 1 its dependent claims 2, 4-8, 12-15, 17, 18, 22, 34, 36, and 37 are objected to because it appears grammatically unclear. It appears that the phrase, “a non-radioactive resulting signal” should be amended to either “resulting from a non-radioactive signal” or “a non-radioactive signal.”

Claims 1, 2, 4-8, 12-18, 22, 34, 36, and 37 are objected to for containing a period after each sub-step. MPEP 608.01(m) clearly states that each claim begins with a capital letter and ends with a period and that, “[p]eriods may not be used elsewhere in the claims except for abbreviations.”

Claims 19-21 are objected to for the following reasons.

Claims 19-21 are objected to because the claims are drawn to a separate invention, which cannot be practiced together with the elected invention.

Claim 1, to which the above claims depend from, is drawn to a method which comprises the step of binding transcriptional factors to immobilized double-stranded DNAs.

Claim 19 is drawn to a method for screening, quantifying and/or recovering compounds that modulate the activity of the transcriptional factors when put in cells. The claim requires the administration of compounds in cells, in order to identify which compounds modulate the activity of the transcription factors, thus not requiring the DNA array nor can the methods be practiced together.

Claim 20 is drawn to a method for screening, quantifying and/or recovering compounds which modulate the activity of enzymes or proteins acting on transcriptional factors which are then further assay for their binding to the transcriptional factors. This method also, cannot be practiced together with claim 1 which requires the use of a DNA array.

Claim 21 is drawn to a method drawn to identification of transcriptional factors and/or peptides which are part of their active complex. This method also cannot be practiced together with the method of claim 1.

Claims 19-21 have not been further treated on their merits.

Appropriate corrections are required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 2, 4-8, 12-18, 22, 34, 36, and 37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 and its dependent claims 2, 4-8, 12-15, 17, 18, 22, 34, 36, and 37; and claim 16 are indefinite for reciting the phrase, "said double-stranded DNA sequence being connected to the surface of the solid support by a spacer *corresponding to* or comprising at least a double-stranded DNA nucleotide sequence..." because it is unclear what is meant when a support "corresponds to" a double-stranded DNA nucleotide sequence and further, it is unclear what difference is inferred between the phrase, "corresponding to" and "comprising."

Claim 14 is indefinite for reciting the phrase, "wherein the specific sequence is repeated on the same molecule," as there are insufficient antecedent basis for the phrase, "the specific sequence" and, "the same molecule."

Claim 22 recites the phrase, "a compound which is able to bind to the consensus sequence" because there is insufficient antecedent basis for the term, "the consensus sequence."

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Amending the claim to identify what the consensus sequence is of would overcome this rejection. For example, "the consensus sequence of _____."

Claim Rejections - 35 USC § 103

The rejection of claims 1-8, 10-15, 17-22, 34, 36, and 38 under 35 U.S.C. 103(a) as being unpatentable over Peterson et al. (WO 95/30026) in view of Saiki et al. (WO 89/11548, published May 18, 1989), made in the Final Office Action mailed on June 29, 2004 is withdrawn in view of the arguments presented in the Amendment received on October 12, 2004.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4-8, 12-18, 22, 36, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peterson et al. (U.S. Patent No. 5,563,036, issued October 8, 1996) in view of Heslot et al. (U.S. Patent No. 6,342,353 B1, issued January 29, 2002, 102(e) date November 4, 1999) and Nerenberg et al. (US 2002/0015198 A1, published August 22, 2002, filed September 20, 2001, priority September 20, 2000).

Peterson et al. disclose a method comprising the steps of: a) binding to a solid substrate (thus insoluble), such as microtiter plate (column 5, line 34-36; column 7, line 23; column 8, lines 59-60), double-stranded DNA sequences (column 6, lines 26-28), at the concentration greater than 0.01 pmoles/cm² (column 10, line 26), wherein said double-stranded DNA is

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connected to the surface of the solid support via avidin-biotin binding (column 7, lines 13-18) or antigen/antibody binding (column 7, lines 18-19); b) contacting transcriptional factors with said solid-surface bound double-stranded DNAs (column 3, lines 1-5; column 4, lines 37-41); and c) identifying and/or quantifying a signal resulting from the binding of the transcriptional factors to said solid-surface bound double-stranded DNAs (column 8, lines 64-68).

Peterson et al. do not teach that the double-stranded DNAs is connected to the surface of the solid-surface support by *a spacer* comprising at least a *double-stranded* DNA nucleotide sequence of between about 50 and about 250 base pairs.

Peterson et al. do not explicitly teach that the solid-support be an array bearing at least 4 spots/cm² of solid support surface.

Peterson et al., while explicitly disclosing that their method involves transcriptional factors that may be derived from, “a host or from *an infectious or parasitic organisms*” (column 3, lines 9-13), as well as HIV TAT (Table 1, column 5, lines 21-25), do not explicitly disclose that the transcriptional factor be HIV Integrase.

Heslot et al. disclose a method involving the immobilization of double-stranded DNA (column 1, lines 9-10) via a spacer arm which is also double-stranded DNA (column 4, lines 36-37), wherein said spacer arm comprises the length of 5 to 1kb in length (column 4, lines 39-40), for the explicit purpose of providing “freedom of movement.” (column 4, lines 16-17).

Nerenberg et al. disclose a well-known use of sensor array comprising high-density array of immobilized nucleic acids, wherein artisans *explicitly* disclose that the sensor array of the invention would be useful in screening in “a solution analytes that might be transcriptional

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factors such as activators or repressors.” [0134]. Nerenberg et al. also explicitly disclose that nucleic acid binding to integrase is measured in their sensor [0134].

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Peterson et al. with that of Heslot et al. and Nerenberg et al. to arrive at the invention as claimed for the following reasons.

The use of spacer arms in an array technology for the purpose of providing freedom to immobilized ligands have been known and established in the art. Previously cited Saiki et al. document as well as the disclosure of Heslot et al. supports such knowledge.

Therefore, one of ordinary skill in the art at the time the invention was made would have been easily motivated to modify the teachings of Peterson et al. with the use of any spacer arm for the advantage of providing freedom to immobilized ligands. One of ordinary skill in the art at the time the invention was made also would have had a clear expectation of success at using a double-stranded DNA spacer arm in conjunction with the method of Peterson et al. because Heslot et al. explicitly demonstrated that such combination would work, as well as disclosing that either double-stranded or other known polymers would work as effectively (column 4, lines 40-45).

MPEP, at 2143.02 states that the prior art can be modified or combined to reject claims as obvious as long as there is a reasonable expectation of success. As already discussed above, one of ordinary skill in the art would have had a clear expectation of success at using a double-stranded DNA spacer arm in combination with the method disclosed by Peterson et al. as the use of such technologies has been well-known, enabled, and established in the art.

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With regard to the density limitation of the solid support being an array comprising at least 4 spots per cm², the advantage of using a high-density microarray has been well-established in the art as allowing multiple reactions in a miniaturized area, and whether the surface comprise at least 4 spots or any number of spots would be well-within the purview of an ordinarily skilled artisan in the art of array technology.

Therefore, for the above reasons, claims 1, 6, 8, 12-17, 22, 36, and 37 are obvious over the cited references.

With regard to claim 2, Peterson et al. disclose the transcriptional factor being present at a concentration lower than 20 nM (column 10, lines 40-41).

With regard to the labeling being non-radioactive (instant claim 4) or obtained through enzymatic reactions (instant claim 5), Peterson et al. disclose that the labeling could be luminescence (or non-radioactive), or indirect detection such as epitope tag, an enzyme (column 6, lines 13-17).

With regard to the transcription factors being selected from those recited in the Markush group of claim 7, Peterson et al. disclose a plurality of the recited transcriptional factors in their Table 1 (beginning at column 3, line 30 through column 5).

With regard to screening for compounds that modulate the binding of transcriptional factors (instant claim 18), Peterson et al. disclose that the mixture applied as a sample comprises candidate pharmacological compounds that comprise functional chemical groups necessary for structural interactions with proteins and/or DNA (column 5, line 35; column 7, lines 28-46).

Therefore, for the above reasons, the invention as claimed is *prima facie* obvious over the cited references.

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Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peterson et al. (U.S. Patent No. 5,563,036, issued October 8, 1996) in view of Heslot et al. (U.S. Patent No. 6,342,353 B1, issued January 29, 2002, 102(e) date November 4, 1999) and Nerenberg et al. (US 2002/0015198 A1, published August 22, 2002, filed September 20, 2001, priority September 20, 2000) as applied to claims 1, 2, 6-8, 12-18, 22, 36, and 37 above, and further in view of Dattagupta et al. (U.S. Patent No. 4,968,602, issued November 6, 1990).

The teachings of Peterson et al., Heslot et al., and Nerenberg et al. have been already discussed above.

While Peterson et al. explicitly disclose that avidin/biotin binding could be employed for immobilizing double-stranded DNA, none of the artisans explicitly disclose that streptavidin, in place of avidin could be employed.

Dattagupta et al. explicitly state that biotin can be coupled to either avidin or streptavidin (column 18, lines 32-37).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to substitute the avidin with streptavidin of Dattagupta et al. to arrive at the claimed method involving streptavidin/biotin binding for the following reasons.

MPEP, at 2143.02, states that the prior art can be modified or combined to reject claims as *prima facie* obvious as long as there is a reasonable expectation of success. Given that the use of avidin or streptavidin for its binding with biotin for the purpose of immobilizing nucleic acids have been well-established in the art as established by the date of the patent of Dattagupta et al. as well as their explicit teaching, one of ordinary skill in the art at the time the invention was

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made would have had a clear expectation of success at modifying the teachings of Peterson et al., Heslot et al., and Nerenberg et al. to arrive at the invention as claimed.

Therefore, for the above reasons, the invention as claimed is *prima facie* obvious over the cited references.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 2, 4-8, 12-18, 22, 34, 36, and 37 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-21, 25, and 26 of copending Application No. 10/821,568. Although the conflicting claims are not identical, they are not patentably distinct from each other for the following reasons.

Independent claim 1 of the instant application and claim 1 of the '568 application are both drawn to a method of detection involving solid-support bound double-stranded DNA and transcriptional factors, wherein said solid-support bound double-stranded DNA are immobilized to the solid support via a spacer of certain length. Claim 1 of the '568 application recites that said spacer comprises a length of about 6.8 nm, while claim 1 of the instant application recites

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that the length is from about 50 to 250 base pairs, both ranges of which would necessarily overlap.

While the method of signal generation involved in the '568 application is drawn to antibody, the instant invention embraces such detection method as embraced by the generic detection method recited in claim 1 – non radioactive signal.

The transcriptional factors involved in the method of the instant claims and claims of the '568 application are selected from the same Table 1 (see instant claim 7, claim 16 of the '568 application).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

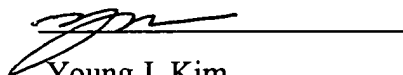
No claims are allowed.

Inquiries

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Young J. Kim whose telephone number is (571) 272-0785. The Examiner can normally be reached from 8:30 a.m. to 6:00 p.m. Monday through Thursday. If attempts to reach the Examiner by telephone are unsuccessful, the Primary Examiner in charge of the prosecution, Dr. Kenneth Horlick, can be reached at (571) 272-0784. If the attempts to reach the above Examiners are unsuccessful, the Examiner's supervisor, Gary Benzion, can be reached at (571) 272-0782. Papers related to this application may be submitted to Art Unit 1637 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 CFR 1.6(d)). NOTE: If applicant does submit a paper by FAX, the original copy should be retained by applicant or applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED, so as to avoid the processing of duplicate papers in the Office. All official

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documents must be sent to the Official Tech Center Fax number: (571) 273-8300. For Unofficial documents, faxes can be sent directly to the Examiner at (571) 273-0785. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (571) 272-1600.



Young J. Kim

Patent Examiner **YOUNG J. KIM**

Art Unit 1637 **PATENT EXAMINER**

1/6/05

yjk